GOBIERNO DE CHILE
CONICYT

CHILE, SCIENCE AND TECHNOLOGY

CONICYT-Chile

January 2004

GOBIERNO DE CHILE
CONICYT

CHILE. GENERAL FACTS

- Area: 756.950 km^2
- Population: 15.116.435
- Labour force: 5.877.149
- Infant mortality: 9,12 (0/00)
- GDP 2002 :US$ 65,2 billions
- GDP p/capita 2002: US$ 4.314
- Inflation rate 2002 2,8%
- Literacy rate 95,8%
- Education 2nd level 36,0%
- Education 3rd level 16,0%

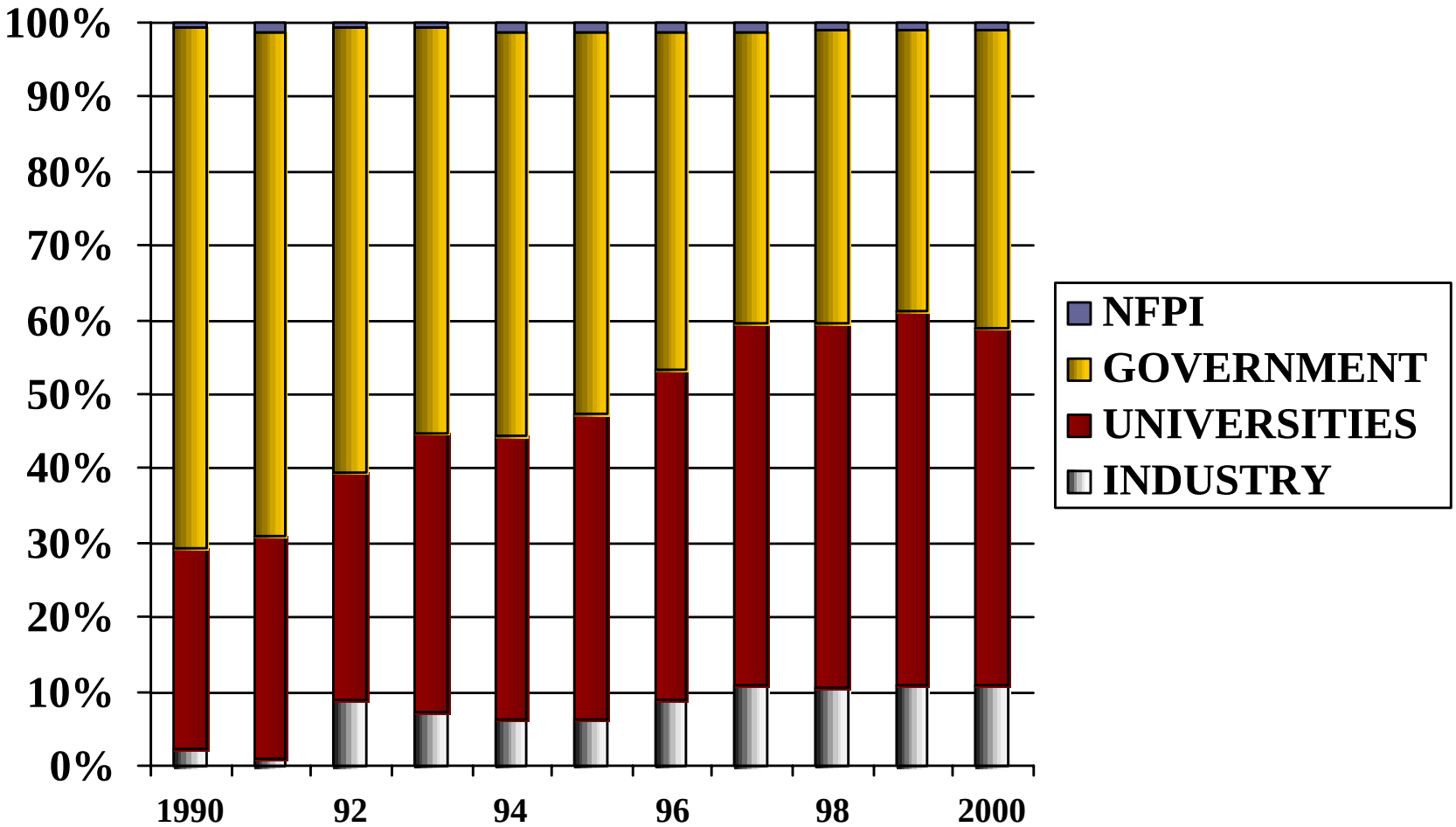
GOBIERNO DE CHILE
CONICYT

SCIENCE AND TECHNOLOGY

- Scientific and technological research is carried out, mainly at the universities and in public research institutes
- Industry has begun, in the last years to finance research and create its own research institutes.
- Annual allocations to science, technology and innovation are approx. US$ 500 millions.

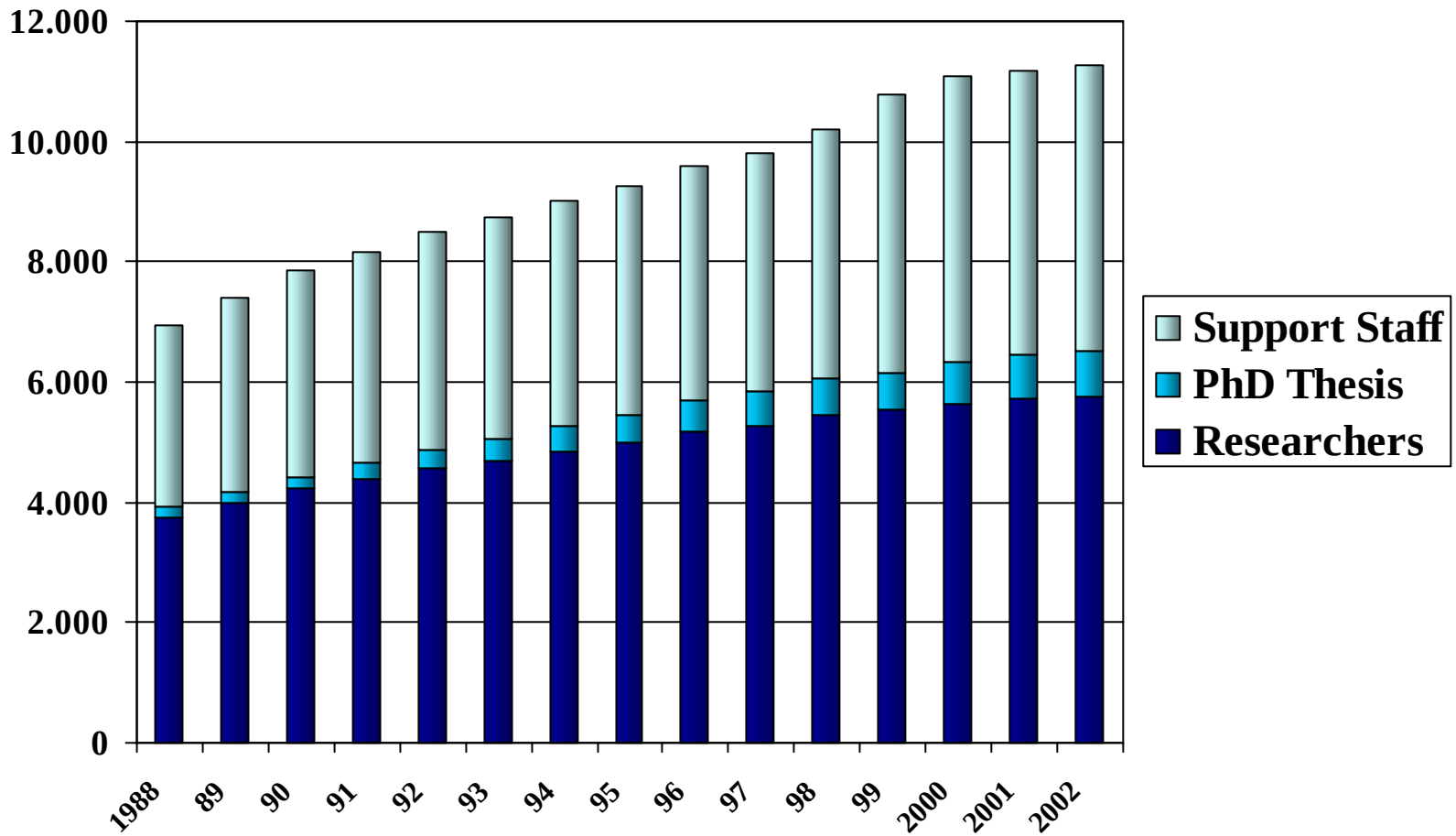
GOBIERNO DE CHILE
CONICYT

EXPENDITURE IN R&D BY SECTOR



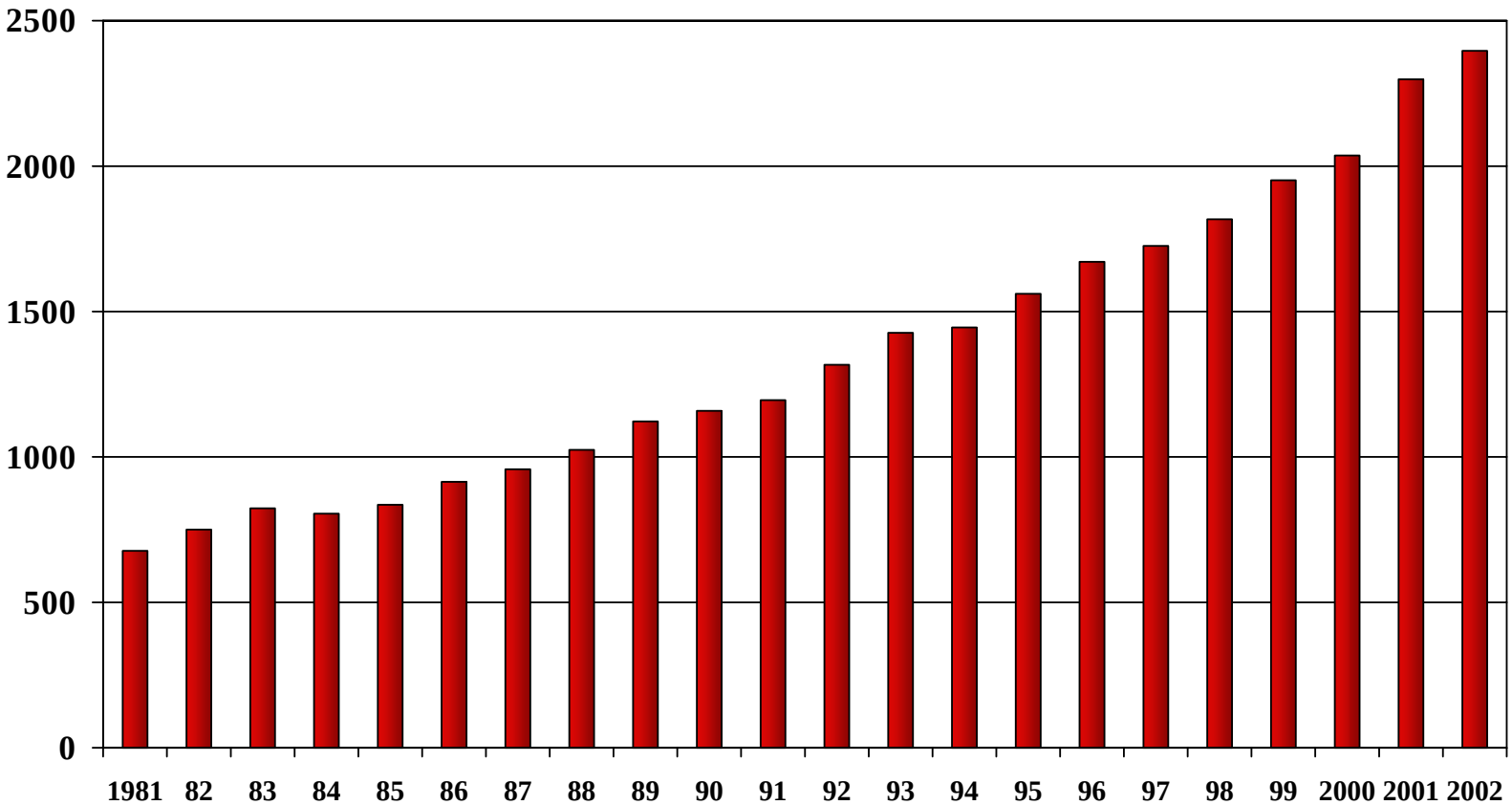
GOBIERNO DE CHILE
CONICYT

ACTIVE SCIENTISTS AND SUPPORT PERSONNEL (FTE)



GOBIERNO DE CHILE
CONICYT

NUMBER OF PAPERS IN MAIN STREAM JOURNALS



SCIENTIFIC, TECHNOLOGICAL AND INNOVATION POLICY

- Scientific and technological policy is the responsibility of CONICYT (*National Commission for Scientific and Technological Research*)
  - CONICYT defines the national programmes and administers the necessary instruments
- Innovation and development policy is the responsibility of the Ministry of Economics
  - The Ministry, through the Promotion Corporation (CORFO) administers the instruments
  - Defines the innovation and development program

GOBIERNO DE CHILE
CONICYT

CONICYT. MAIN OBJECTIVES

- ✓ To define science and technology policy;
- ✓ To promote and finance research programmes and projects;
- ✓ To support the training of human resources and support the mobility of researchers;
- ✓ To encourage the dissemination and assessment of science and technology,
- ✓ To facilitate access to scientific information;
- ✓ To promote international relations.

GOBIERNO DE CHILE
CONICYT

CONICYT MAIN PROGRAMMES

- Financing of research projects in pure and applied science.

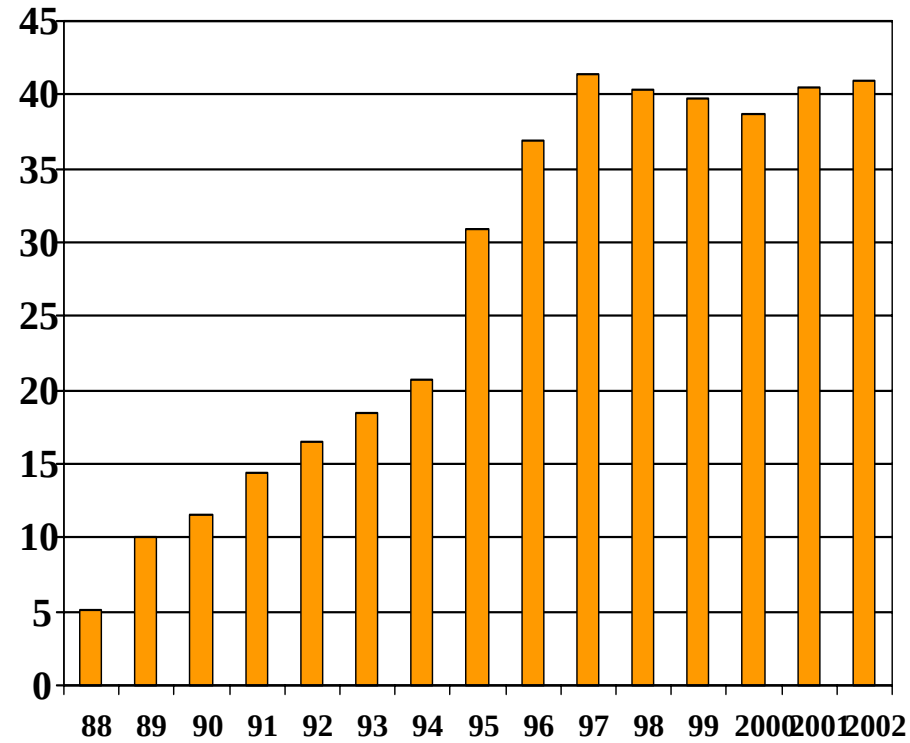
  A special fund, created in 1982, FONDECYT, finances individual high quality research projects across all disciplines.

  Every year there is call for proposals in all areas. Projects are peer-reviewed by Chilean and Foreign researchers. Some 380 new projects are financed each year, with a total of approximately. 1.100 on-going projects.

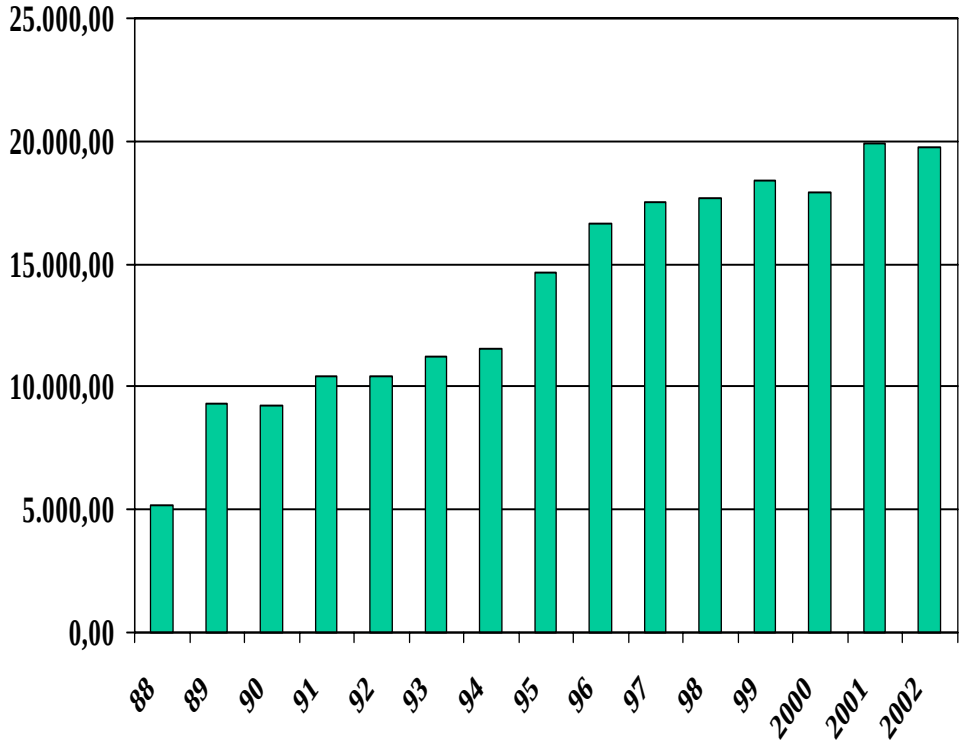
GOBIERNO DE CHILE
CONICYT

FONDECYT ALLOCATIONS

In Mill. US$ 1992

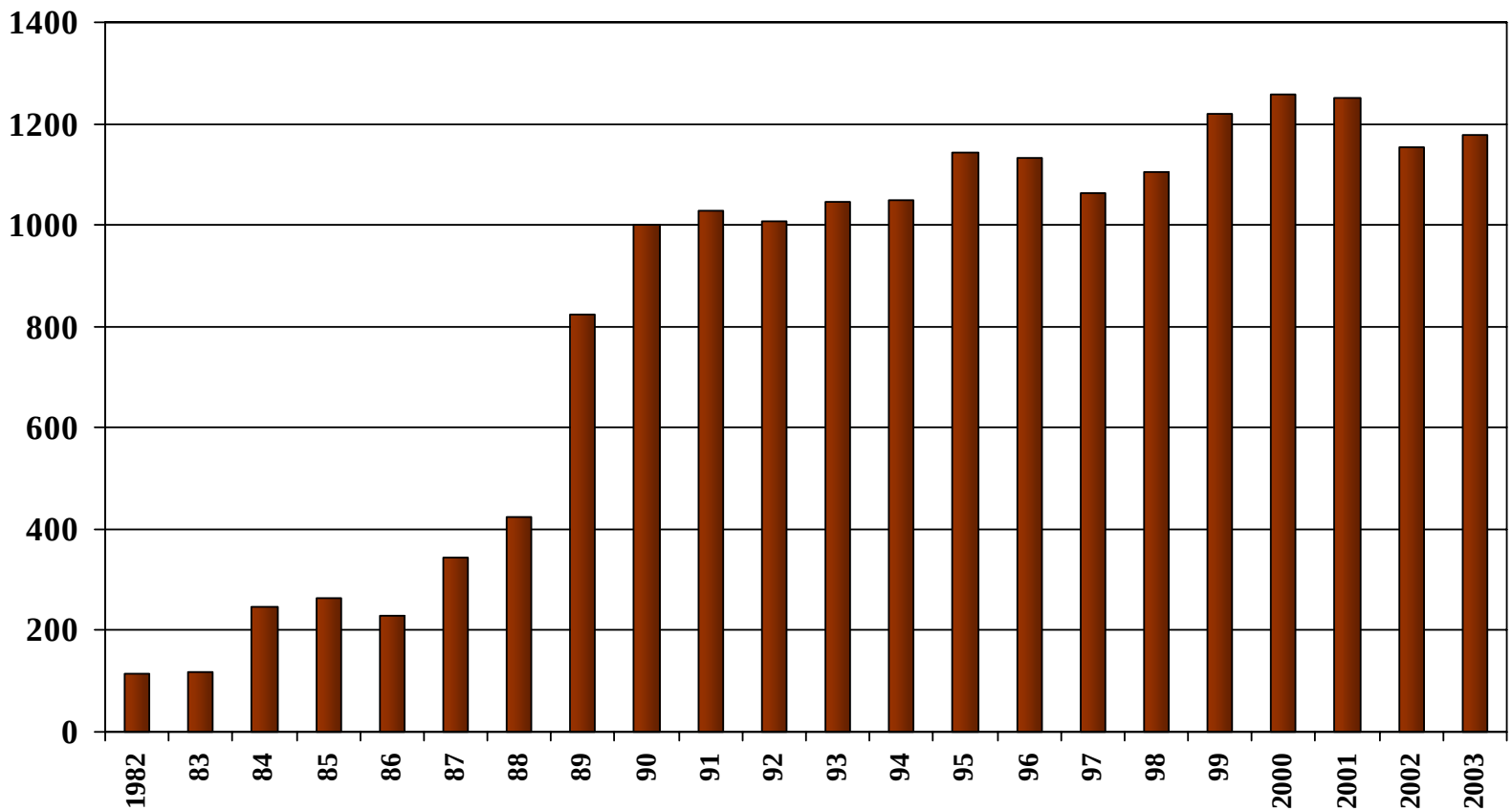


In Mill. Ch$ 2000



GOBIERNO DE CHILE
CONICYT

FONDECYT. NUMBER OF ON-GOING PROJECTS PER YEAR



CONICYT MAIN PROGRAMMES

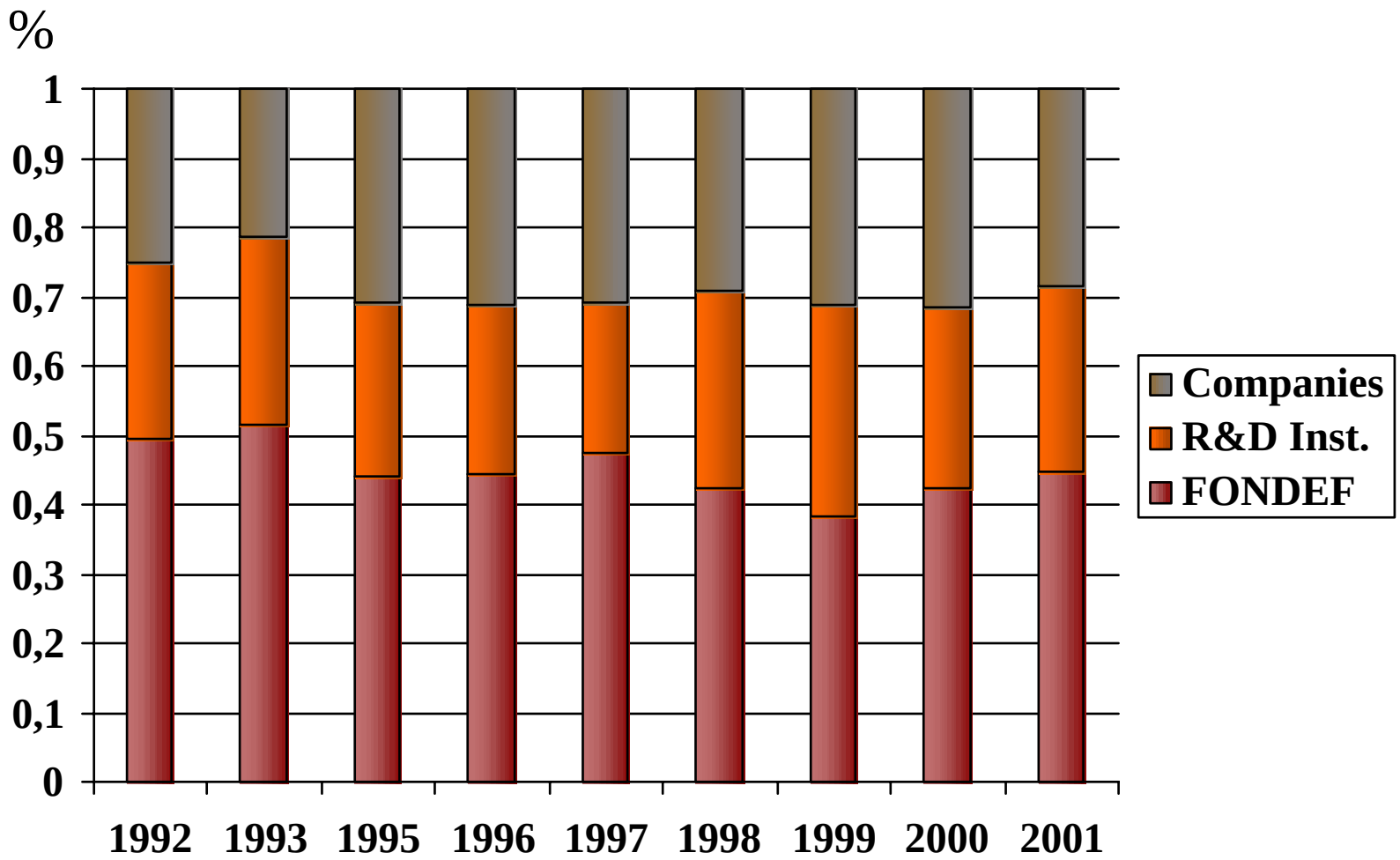
- Linking R&D institutions with industry.

  A special Fund, FONDEF, finances research projects in priority areas, that can be transferred to the productive sector. Two types of projects are financed: R&D, and Technology Transfer.

  The priority areas are: Agriculture, Fisheries, Forestry, Mining, Information Technologies, Manufacture, Water and energy, Education, Health, and Infrastructure.

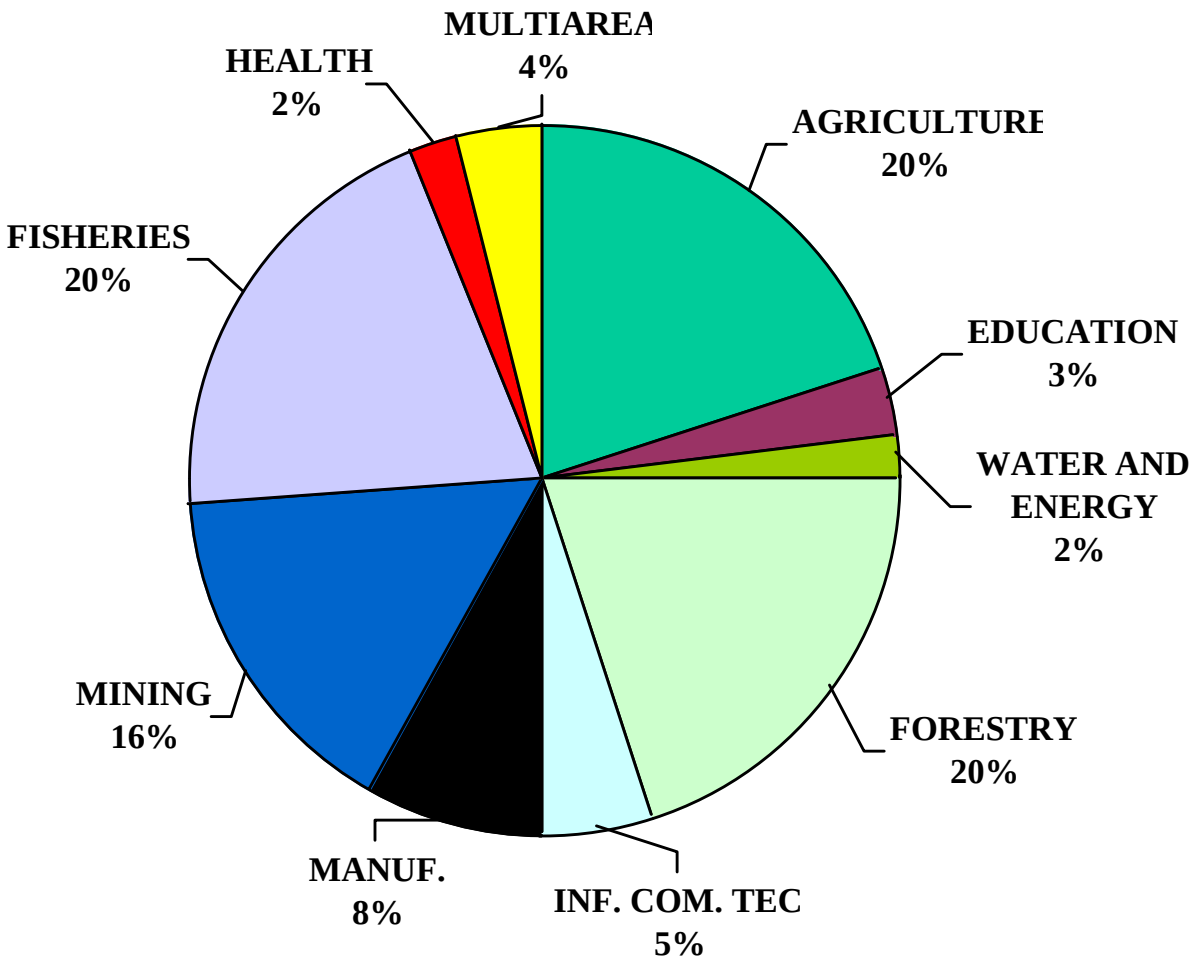
GOBIERNO DE CHILE
CONICYT

FONDEF. PARTICIPATION OF THE PRIVATE SECTOR AND RESEARCH INSTITUTIONS IN THE FUNDING OF R&D PROJECTS



GOBIERNO DE CHILE
CONICYT

FONDEF. PROJECTS FINANCED BY PRIORITY AREA



CONICYT MAIN PROGRAMMES

- FONDAP. Fund for advanced research.

  Its main objective is to create Centres of Excellence with the participation of groups that have achieved high level of development, and will benefit from working together in proven research lines. The centres are organised within non profit institutions which have demonstrated experience in research and post graduate education at doctoral level.

This programme is complemented with the Millennium Initiative administered through the Ministry of Planning.

FONDAP CENTRES OF EXCELLENCE

Each Centre receives, yearly, an allocation of around US$ 900.000

- CENTRE OF ASTROPHYSICS
- CENTRE FOR CELL REGULATION AND PATHOLOGY
- CENTRE FOR ADVANCED INTERDISCIPLINARY RESEARCH IN MATERIALS

GOBIERNO DE CHILE
CONICYT

FONDAP CENTRES OF EXCELLENCE

- CENTRE FOR ADVANCED STUDIES IN ECOLOGY AND BIODIVERSITY
- CENTRE FOR OCEAN RESEARCH
- CENTRE FOR MATHEMATICAL MODELLING
- INSTITUTE FOR FUNDAMENTAL AND APPLIED BIOLOGY

GOBIERNO DE CHILE
CONICYT

MILLENNIUM INSTITUTES

- MILLENNIUM INSTITUTE FOR ADVANCED STUDIES IN CELL BIOLOGY AND BIOTECHNOLOGY
- CENTER FOR SCIENTIFIC STUDIES
- MILLENNIUM INSTITUTE FOR FUNDAMENTAL AND APPLIED BIOLOGY

The Millennium Initiative also supports 10 Science Nuclei in different areas of knowledge.

CONICYT MAIN PROGRAMMES

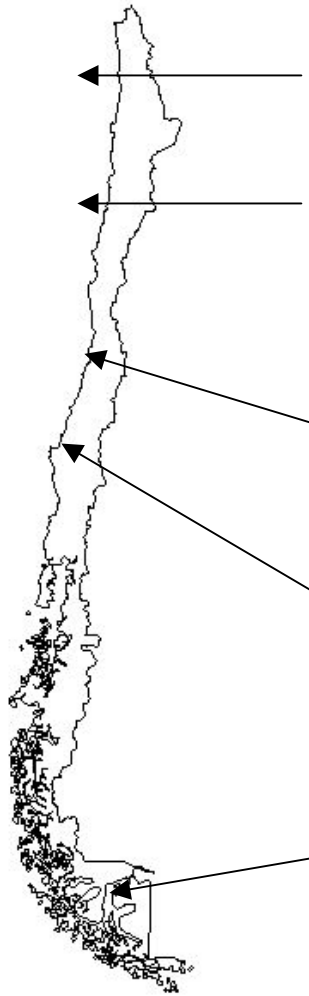
- REGIONAL SCIENCE AND TECHNOLOGY DEVELOPMENT PROGRAMME

  Its main purpose is to increase the level of research and training in the regions of Chile to a point of critical mass, stimulating the development of disciplines or specific areas with the aim of creating Centres of Excellence, consistent with regional development programmes.

  Each project is approved for a 5 year period and co-financed by the Regional Government. CONICYT finances approx. US$ 300.000 per Program, per year.

GOBIERNO DE CHILE
CONICYT

REGIONAL PROGRAMME CENTRES



- MAN AND THE DESERT. INTEGRATING PAST AND FUTURE I Region
- CENTRE FOR ADVANCED STUDIES IN ARID ZONES IV Region
- CENTRE FOR RESEARCH IN SILVOAGRICULTURAL BIOTECHNOLOGY, VI & VII Region
- CENTRE FOR ADVANCED RESEARCH IN POLYMERS VIII Region
- CENTRE FOR THE STUDY OF THE QUATERNARY OF FUEGO-PATAGONIA AND ANTARCTICA XII Region

CONICYT MAIN PROGRAMMES

- THE CHILEAN GENOME INITIATIVE

  Its main purpose is to systematically involve the country in the global developments in genetics and bio-information in those areas relevant to the national economy.

  The Initiative has two components:

  - The Renewable Natural Resources Genome Programme, with a total amount of US$ 3.5 Millions
  - The Bio-Mining Programme with a total amount of US$ 5 Millions,

THE CHILEAN GENOME INITIATIVE NATURAL RESOURCES GENOME PROGRAMME

Three main research projects have been initiated:

- Functional Genomics in Nectarines
- Scientific Platforms for the Development of Vegetal Genomics. Phase I. Functional Genomic of Grapevine.
- Genomic studies and genetic expression in Grapevine. Response to viral infections and development of diagnosis system.

With the participation of universities, research institutes and the private sector. US$ 3.5 Millions have been granted. The total budget reaching US$ 6.3 Millions

THE CHILEAN GENOME INITIATIVE
BIO-MINING PROGRAMME

- Funded jointly by CONICYT, The Promotion Corporation (CORFO) and the main national copper mining enterprise, CODELCO.
- An investment society to develop bio-mining in Chile has been created: Biosigma S.A., with the participation of CODELCO and the Nippon Mining and Metals Co.with a first capital of US$ 3Millions
- A 1st call for proposals has been opened with an allocation of US$ 2 Millions.

CONICYT MAIN PROGRAMMES

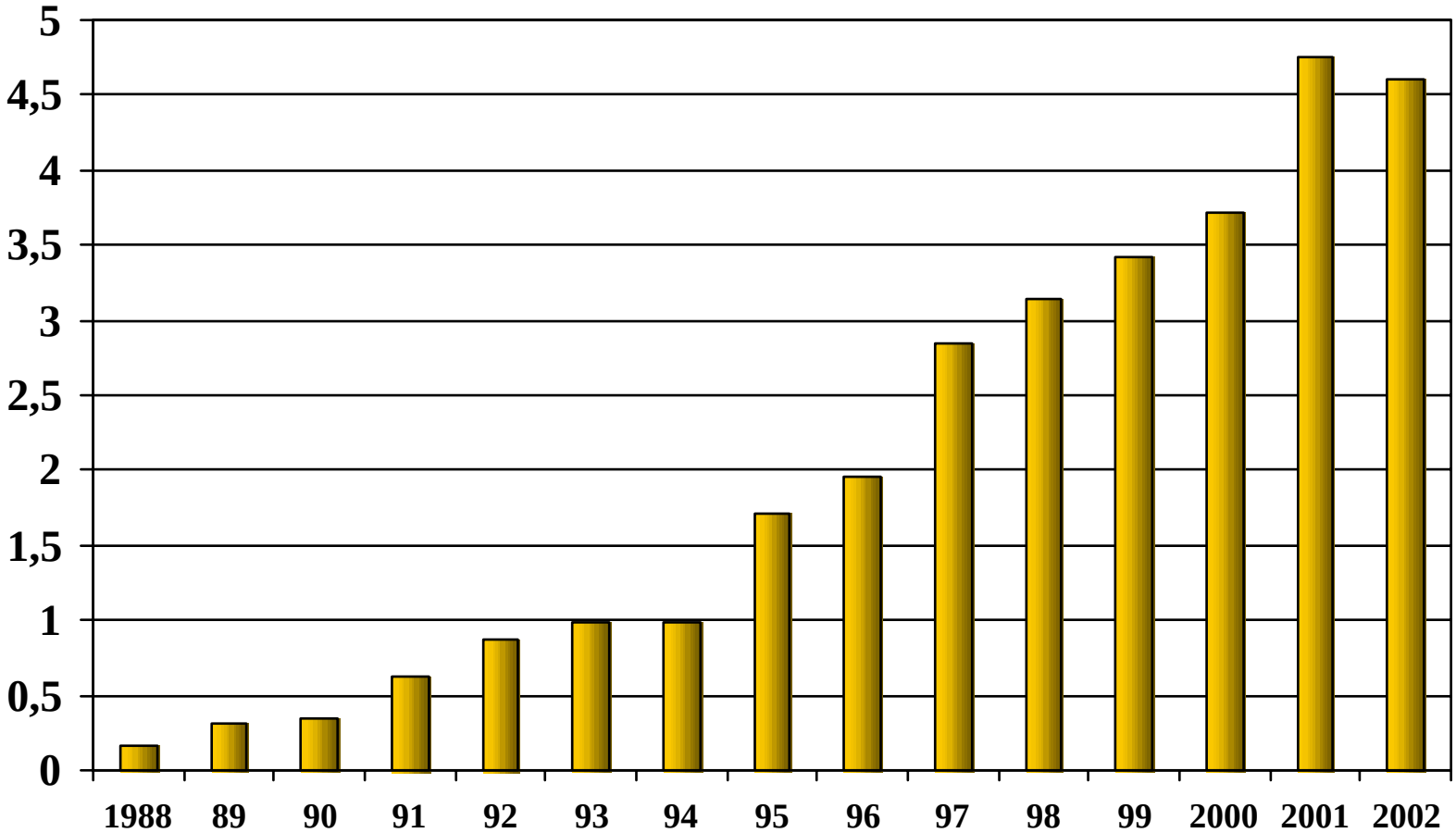
- Human resources training and post graduate fellowships
  - Accreditation of Doctoral Programmes, in conjunction with the Ministry of Education
  - Fellowships to young graduates or with equivalent professional qualifications, to study in Chilean universities, leading to Doctoral or Masters Degrees.
  - Special programmes to complete doctoral theses
  - Doctoral and Masters studies abroad in those areas where local expertise is lacking.
  - Programme for Technology Study Trips.

GOBIERNO DE CHILE
CONICYT

ALLOCATIONS NATIONAL FELLOWSHIP PROGRAMME

For Post Graduate Studies in Chile

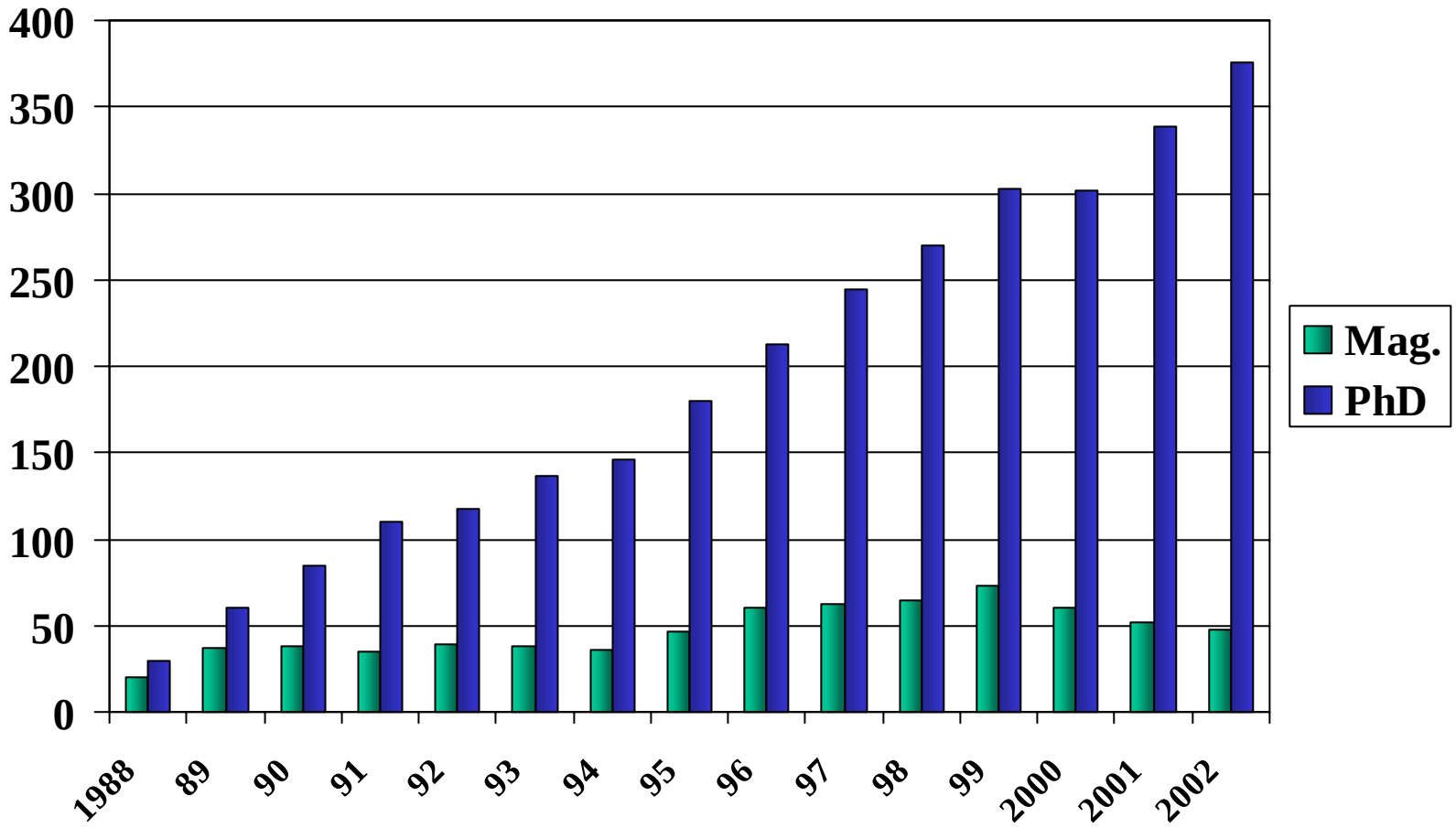
(in Mill US$)



GOBIERNO DE CHILE
CONICYT

NATIONAL FELLOWSHIP PROGRAMME. NUMBER OF FELLOWSHI PS PER YEAR

For Post Graduate Studies in Chile



CONICYT MAIN PROGRAMMES

- EXPLORA, A programme for the dissemination and assessment of science and technology. Includes:
  - Annual grants to finance high impact and high quality initiatives in this area
  - National Science and Technology Week
  - Travelling Interactive Exhibitions: Science and Technology journeys to the regions
  - National Youth Science Conferences
  - Channelling Science and Technology Information

In the year 2003 the total budget for the programme was approx. US$ 1 Million, and the activities cover all the country.

CONICYT MAIN PROGRAMMES

- Access to scientific information
  - Access to international scientific information, through a national consortium. 1st Stage subscription to the Web of Science for all national universities. 2nd Stage access to full text journals and other data bases.
  - Access to scientific information published in Chile. SciELO Scientific Electronic Library on Line. To-day 40 full text journals going back to 1997. http://www.scielo.cl
  - Access to the information on Chilean Science and Technology System. Includes an integrated data base of curricula, research projects, publications and research institutions, and a the modernisation of the project management cycle. A budget of US$ 1.300 millions has been allocated

The three programmes are linked and integrated

CONICYT MAIN PROGRAMMES

- International relations
  - Bilateral cooperation. Includes south-south and north-south agreements. The agreements include:
    - Mobility and exchange of researches within a framework of shared projects,
    - Internships abroad and
    - Organisation of seminars, courses and conferences

    Today 47 agreements have been signed with countries of all continents.
  - Multilateral co-operation
  - Cooperation Agreement in Science and Technology with the European Union:

    The agreement allows the participation Chilean researchers in the the Sixth Framework Program, and other joint research and innovation projects.

BICENTENNIAL PROGRAMME OF SCIENCE AND TECHNOLOGY

Building a Knowledge Based Economy Programme fianced through a loan of the World Bank

The main signposts are:

- Broadening the Science Base
- Linking Academia to the Productive Sector
- Differenciation
- Leverage of resources
- Coherence
- Institutional rearrengement
- Long term policy vision
- Monitoring and evaluation

The loan agreement was signed on August 2003

GOBIERNO DE CHILE
CONICYT

BICENTENNIAL PROGRAMME OF SCIENCE AND TECHNOLOGY

Three main components:

- Design, Management, Evaluation and Awareness
- Strengthening the Science Base
  - Centres of Excellence
  - Academic Insertion
  - Major Equipment
  - Science Scholarships, in the country and abroad
  - Research Rings
- Public Private Linkages
  - Consortia
  - Insertion in Industry
  - International Cooperation
  - Industrial Scholarships, in the country and abroad
  - Research Rings

GOBIERNO DE CHILE
CONICYT

BICENTENNIAL PROGRAMME OF SCIENCE AND TECHNOLOGY

PANORAMIC VIEW IN MILL.US$

SUMMARY	**2004**	**2005**	**2006**	**Total**
Component 1	1,78	2,42	2,20	**6,40**
Component 2	1,98	9,88	7,98	**19,84**
Component 3	3,88	9,46	10,45	**23,79**
Incidentals & others	0,10	0,10	0,10	**0,30**
TOTAL	**7,73**	**21,86**	**20,74**	**50,33**

GOBIERNO DE CHILE
CONICYT

NEW INITIATIVES

- Cross-Sector Cooperation. Agreements with other Government Agencies to facilitate S&T cross-sector work.
  - Health Research National Fund. In cooperation with the Ministry of Public Health
  - Centre of Studies in Public Safety, under agreement with the Ministry of Interior.
  - Programme Towards a world class Aquaculture, in conjunction with the innovation Programme and financed through the IADB
  - Scientific and Technological Action Plan for Red Tide, in conjunction with CORFO

GOBIERNO DE CHILE
CONICYT

THE INNOVATION AND DEVELOPMENT POLICY

- Competitive funds have been created at the Ministry of Economy to support innovation, with a yearly budget of:
  - FONTEC, The National Fund for Scientific and Productive Development, US$ 11.82 Millions
  - FDI, Fund for Innovation Development US$ 9 millions
  - FIA, Foundation for Agrarian Innovation, 6 US$ Mill.
  - FMI, Fund for Research in Mining
  - FAT, Fund for Technical Assistance
  - PROFOS, Associative Promotion Projects

GOBIERNO DE CHILE
CONICYT

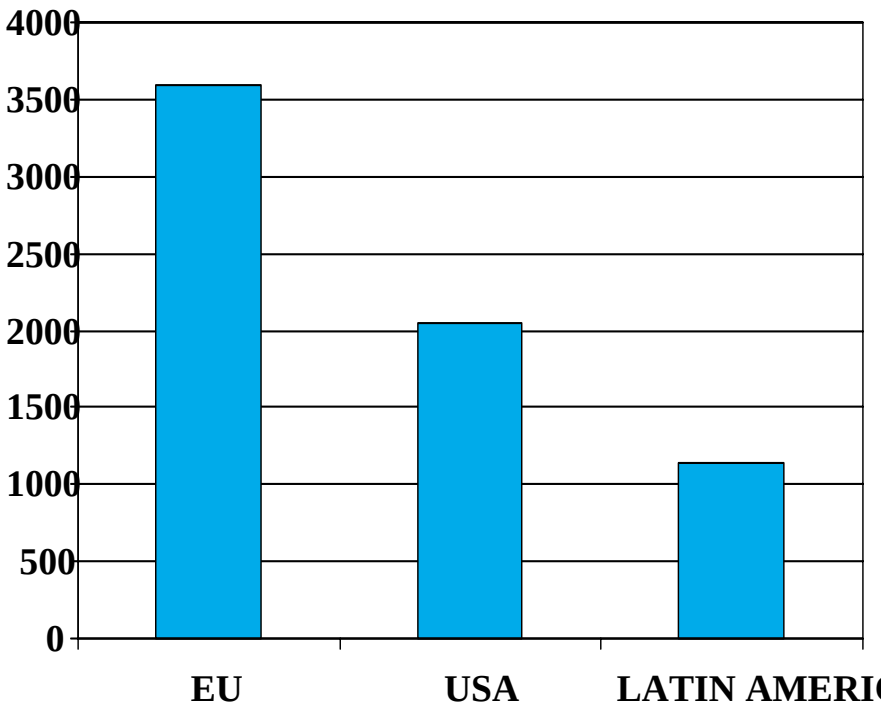
EVOLUTION OF INNOVATION AND DEVELOPMENT FUNDS

IN Millions US$

YEAR	FONDECYT	FONDEF	FONTEC	FDI	FIA
89	10,08	***	1,53	0,00	0,44
90	11,59	***	1,70	0,00	0,44
91	14,41	***	1,07	0,00	n/i
92	16,47	16,62	7,75	0,00	0,32
93	18,45	25,73	8,93	0,00	0,33
94	20,75	25,33	9,83	0,00	0,35
95	30,91	14,30	12,84	9,31	2,33
96	36,85	18,60	14,26	13,32	4,44
97	41,35	20,02	16,47	16,38	6,39
98	40,29	19,06	15,90	16,12	7,09
99	39,82	13,07	14,40	13,69	7,56
2000	38,71	19,40	13,59	13,45	7,39
2001	38,29	17,25	14,11	11,62	7,25

INTERNATIONAL COOPERATION

Number of co-authored papers 1996-2001



* L.America includes: Brazil, Argentina, Mexico, Venezuela, Colombia

FRANCE	725
SPAIN	704
GERMANY	691
UK	522
ITALY	257
SWEDEN	154
NETHERLANDS	146
BELGIUM	136
DENMARK	76
AUSTRIA	70
FINLAND	52
PORTUGAL	37
GREECE	17
IRELAND	3

Source: ISI Database

GOBIERNO DE CHILE
CONICYT

COLLABORATION WITH EU

Main Collaboration by Areas and by Countries

MAJOR AREAS	COUNTRIES WITH MAJOR COLLABORATION		
Mathematics	France	Germany	Spain
Physics	Belgium	France	Germany
Chemistry	Spain	France	Germany
Biology	Germany	Spain	U.K.
Earth Sciences	U.K.	France	Germany
Astronomy	Int. Org.	France	U.K.
Biotechnology	Spain	U.K.	France
Engineering Sciences	Spain	France	Germany
Medical Sciences	U.K.	Germany	France
Agrigultural Sciences	U.K.	Spain	Germany
Social Sciences	U.K.	Spain	Germany
Multiidisciplinary	France	U.K.	Germany
Source: ISI Database			